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Examiner Kruer

703 872 9602

FROM:

Gary R. Plotecher

PAGES:

CLIENT-MATTER:

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Message:

Re: 09/311,480

Cable Semiconducting Shield

Attached to this facsimile is a copy of the replacement claims and a copy of the red-line claims.

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Claims

1. A cable comprising one or more electrical conductors, communications media or a core, each electrical conductor, communications medium, or core being surrounded by a layer comprising:
 - (a) polyethylene; polypropylene; or mixtures thereof;
 - (b) carbon nanotubes;
 - (c) a conductive carbon black other than carbon nanotubes; and
 - (d) optionally, (i) a copolymer of acrylonitrile and butadiene wherein the acrylonitrile is present in an amount of about 30 to about 60 percent by weight based on the weight of the copolymer, or (ii) a silicone rubber.
2. The cable defined in claim 1 wherein component (a) is a copolymer of ethylene and an unsaturated ester.
3. The cable defined in claim 2 wherein the unsaturated ester of the ethylene/unsaturated ester copolymer is selected from the group consisting of vinyl esters, acrylic acid esters, and methacrylic acid esters, and wherein the unsaturated ester is present in the ethylene/unsaturated ester copolymer in an amount of about 20 to about 55 percent by weight.
4. The cable defined in claim 1 wherein the layer is a semiconducting shield and component (b) is present in an amount of about 13 to about 100 parts by weight per 100 parts by weight of component (a).
5. The cable defined in claim 1 wherein the layer is a semiconducting shield and, for each 100 parts of component (a), component (b) is present in an amount of about 1 to about 35 parts by weight; component (c) is present in an amount of about 13 to about 100 parts by weight; and the weight ratio of component (b) to component (c) is about 0.1:1 to about 10:1.

6. The cable defined in claim 1 wherein the layer is an insulation layer and component (b) is present in an amount of about 0.01 to about 1 part by weight per 100 parts by weight of component (a).

7. A cable comprising one or more electrical conductors, communications media or a core, each electrical conductor, communications medium, or core being surrounded by a semiconducting shield layer comprising:

(a) an ethylene/unsaturated ester copolymer comprising an unsaturated ester selected from the group consisting of vinyl esters, acrylic acid esters, and methacrylic acid esters, and wherein the unsaturated ester is present in the ethylene/unsaturated ester copolymer in an amount of about 20 to about 55 percent by weight.

(b) carbon nanotubes;

(c) a conductive carbon black other than carbon nanotubes; and

(d) optionally, (i) a copolymer of acrylonitrile and butadiene wherein the acrylonitrile is present in an amount of about 30 to about 60 percent by weight based on the weight of the copolymer, or (ii) a silicone rubber.

with the proviso that, for each 100 parts of component (a), component (b) is present in an amount of about 2 to about 20 parts by weight; component (c) is present in an amount of about 15 to about 80 parts by weight; and the weight ratio of component (b) to component (c) is about 0.2:1 to about 8:1.

8. A cable comprising one or more electrical conductors, communications media or a core, each electrical conductor, communications medium, or core being surrounded by a layer comprising:

(a) polyethylene; polypropylene; or mixtures thereof;

(b) carbon nanotubes;

with the proviso that, for each 100 parts of component (a), component (b) is present in an amount of about 0.05 to about 0.3 part by weight; and

(c) a conductive carbon black other than carbon nanotubes.

9. A composition comprising:

(a) an ethylene/unsaturated ester copolymer comprising an unsaturated ester selected from the group consisting of vinyl esters, acrylic acid esters, and methacrylic acid esters, and wherein the unsaturated ester is present in the ethylene/unsaturated ester copolymer in an amount of about 20 to about 55 percent by weight.

(b) carbon nanotubes;

(c) a conductive carbon black other than carbon nanotubes; and

(d) optionally, (i) a copolymer of acrylonitrile and butadiene wherein the acrylonitrile is present in an amount of about 30 to about 60 percent by weight based on the weight of the copolymer, (ii) or a silicone rubber

with the proviso that, for each 100 parts of component (a), component (b) is present in an amount of about 1 to about 35 parts by weight; component (c) is present in an amount of about 13 to about 100 parts by weight; and the weight ratio of component (b) to component (c) is about 0.1:1 to about 10:1.

10. A composition comprising a polymer selected from the group consisting of polyethylene; polypropylene; and mixtures thereof, and 0.01 to 1 part by weight carbon nanotubes per 100 parts by weight of the polymer.

Claims

1. A cable comprising one or more electrical conductors or communications media or a core of ~~two or more electrical conductors or communications media~~, each electrical conductor, communications medium, or core being surrounded by a layer comprising:
 - (a) polyethylene; polypropylene; or mixtures thereof;
 - (b) carbon nanotubes;
 - (c) ~~optionally~~, a conductive carbon black other than carbon nanotubes; and
 - (d) optionally, (i) a copolymer of acrylonitrile and butadiene wherein the acrylonitrile is present in an amount of about 30 to about 60 percent by weight based on the weight of the copolymer, or (ii) a silicone rubber.
2. The cable defined in claim 1 wherein component (a) is a copolymer of ethylene and an unsaturated ester.
3. The cable defined in claim 2 wherein the unsaturated ester of the ethylene/unsaturated ester copolymer is selected from the group consisting of vinyl esters, acrylic acid esters, and methacrylic acid esters, and wherein the unsaturated ester is present in the ethylene/unsaturated ester copolymer in an amount of about 20 to about 55 percent by weight.
4. The cable defined in claim 1 wherein the layer is a semiconducting shield and component (b) is present in an amount of about 13 to about 100 parts by weight per 100 parts by weight of component (a).
5. The cable defined in claim 1 wherein the layer is a semiconducting shield and, for each 100 parts of component (a), component (b) is present in an amount of about 1 to about 35 parts by weight; component (c) is present in an amount of about 13 to about 100 parts by weight; and the weight ratio of component (b) to component (c) is about 0.1:1 to about 10:1.

6. The cable defined in claim 1 wherein the layer is an insulation layer and component (b) is present in an amount of about 0.01 to about 1 part by weight per 100 parts by weight of component (a).

7. A cable comprising one or more electrical conductors or communications media or a core of two or more electrical conductors or communications media, each electrical conductor, communications medium, or core being surrounded by a semiconducting shield layer comprising:

(a) ~~a copolymer of an ethylene/unsaturated ester copolymer comprising an unsaturated ester~~ selected from the group consisting of vinyl esters, acrylic acid esters, and methacrylic acid esters, and wherein the unsaturated ester is present in the ethylene/unsaturated ester copolymer in an amount of about 20 to about 55 percent by weight.

(b) carbon nanotubes;

(c) a conductive carbon black other than carbon nanotubes; and

(d) optionally, (i) a copolymer of acrylonitrile and butadiene wherein the acrylonitrile is present in an amount of about 30 to about 60 percent by weight based on the weight of the copolymer, or (ii) a silicone rubber.

with the proviso that, for each 100 parts of component (a), component (b) is present in an amount of about 2 to about 20 parts by weight; component (c) is present in an amount of about 15 to about 80 parts by weight; and the weight ratio of component (b) to component (c) is about 0.2:1 to about 8:1.

8. A cable comprising one or more electrical conductors or communications media or a core of two or more electrical conductors or communications media, each electrical conductor, communications medium, or core being surrounded by a layer comprising:

(a) polyethylene; polypropylene; or mixtures thereof; ~~and~~

(b) carbon nanotubes;

with the proviso that, for each 100 parts of component (a), component (b) is present in an amount of about 0.05 to about 0.3 part by weight; and

(c) a conductive carbon black other than carbon nanotubes.

9. A composition comprising:

(a) ~~a copolymer an ethylene/unsaturated ester copolymer comprising an unsaturated ester~~ selected from the group consisting of vinyl esters, acrylic acid esters, and methacrylic acid esters, and wherein the unsaturated ester is present in the ethylene/unsaturated ester copolymer in an amount of about 20 to about 55 percent by weight.

(b) carbon nanotubes;

(c) a conductive carbon black other than carbon nanotubes; and

(d) optionally, (i) a copolymer of acrylonitrile and butadiene wherein the acrylonitrile is present in an amount of about 30 to about 60 percent by weight based on the weight of the copolymer, (ii) or a silicone rubber

with the proviso that, for each 100 parts of component (a), component (b) is present in an amount of about 1 to about 35 parts by weight; component (c) is present in an amount of about 13 to about 100 parts by weight; and the weight ratio of component (b) to component (c) is about 0.1:1 to about 10:1.

10. A composition comprising a polymer selected from the group consisting of polyethylene; polypropylene; and mixtures thereof, and 0.01 to 1 part by weight carbon nanotubes per 100 parts by weight of the polymer.

----- COMPARISON OF FOOTERS -----

-FOOTER 1-

~~686079v1~~ 686079v2

-FOOTER 2-

~~686079~~ 686079v2

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686079/redline

This redlined draft, generated by CompareRite (TM) - The Instant Redliner, shows the differences between -

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